

Modern management of hypertension and heart failure: evidence and practice

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Data on the clinical effectiveness of treatments for hypertension and heart failure are particularly extensive. This should result in the management of these conditions being among the most evidence based in medicine. However, as in many areas of medicine, a significant gap persists between the availability of evidence on effectiveness and the modification of routine clinical practice. This gap between evidence and practice is particularly important in the management of cardiovascular disease since coronary heart disease and stroke have become the two principal global causes of death and disability.¹

Hypertension

The relation between rising blood pressure and cardiovascular mortality is well known. The closer relation between systolic pressure and risk of cardiac events, however, is still underestimated. There is a fivefold increase in cardiovascular risk at high systolic pressures compared to the threefold increase with high diastolic pressure.² It is still the case that many physicians concentrate principally on lowering diastolic pressure while not achieving systolic blood pressure targets.

This problem is further highlighted by the introduction of newer more aggressive blood pressure thresholds for diagnosis and targets for treatment. With these new thresholds, up to one third of the adult population in some countries would qualify as suffering hypertension.

Treating hypertension reduces the risk of cardiovascular mortality and morbidity. However, the scale of risk reductions possible in stroke prevention are reduced in the prevention of coronary heart disease.³

Another group that has been under treated on a systematic basis are the elderly. As their absolute risk of events is much greater, the benefits to patients and to society would be much larger if they were more effectively treated.

CURRENT PRACTICE IN HYPERTENSION

Data from the USA shows that there has been an improvement from the mid 1970s to the early 1990s in the number of hypertensive patients detected. However, there is still an under performance in terms of the number of patients who are receiving treatment. It is estimated for cohort studies that only 27% of the US hypertensive population are achieving a blood pressure of below 140/90 mm Hg.⁴

Data from the UK show a similar pattern. Only 6% of the UK hypertensive population have blood pressure values that are at or below the newer treatment targets for blood pressure

at 140/90 mm Hg.⁵ There is therefore an enormous gap between evidence and practice in the management of hypertension.

REASONS FOR UNDER PERFORMANCE

There are many patient and physician factors that are responsible for the under performance in the management of hypertension.

Patient factors

For patients, the asymptomatic nature of hypertension can lead to problems over concordance with treatment. Patients may therefore perceive a reduced need to take medication. If medication is associated with side effects, they are even less likely to continue taking it. Further difficulties arise in the multiple treatments required by many patients suffering cardiovascular disease. Concordance with treatment becomes significantly affected once patients need to take more than two tablets daily.

Physician factors

There are a number of important physician factors that can lead to under performance. One of the key issues that amplifies failures to reach treatment targets is uncertainty over levels, owing to the changes in the definition of hypertension. Particularly in primary care practice, physicians may not be aware or confident of the recommendations and aims of more aggressive antihypertensive treatment.

There are also issues surrounding whether physicians believe that it is possible to treat hypertension effectively. Physicians may be relatively tolerant of under treating patients because of concerns surrounding the effects of treatment on patients' quality of life. New data help answer a number of these concerns.

The HOT trial effectively shows that in a community based population it was possible to hit blood pressure targets.⁶ In this study 86% of patients achieved a blood pressure of below 140/90 mm Hg. Importantly, these blood pressure levels were maintained for a number of years. The blood pressure reductions in this study were impressive: up to 30 mm Hg systolic and 20–22 mm Hg diastolic (fig 1). Importantly, however, these results were achieved through polypharmacy. On enrolment, two thirds of patients were receiving monotherapy. By the end of the trial only one third of patients were receiving monotherapy, while almost half of the patients were receiving two drugs, and one third of the patients received three or more drugs to control blood pressure. This is similar to the level of polypharmacy required to achieve target blood pressures in

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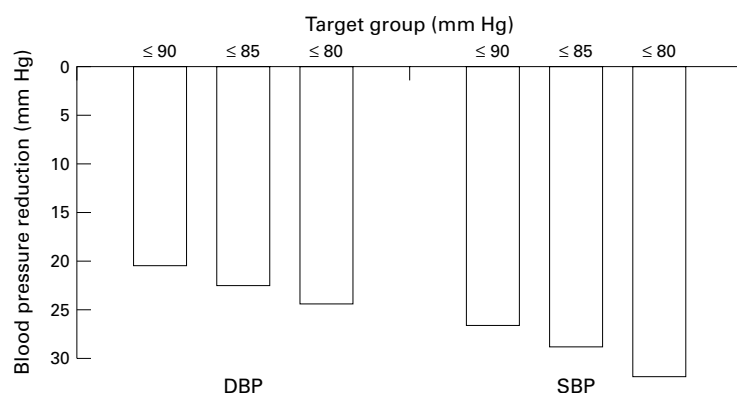


Figure 1 The majority of patients achieved and maintained substantial systolic and diastolic blood pressure reductions in HOT. DBP, diastolic blood pressure; SBP, systolic blood pressure.

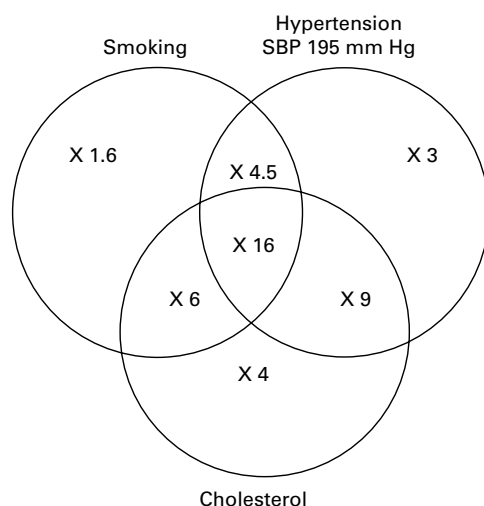


Figure 2 The interaction of risk factors (smoking, hypertension, and cholesterol) substantially increases a patient's overall risk of coronary heart disease.

UKPDS.⁷ Interestingly, the HOT study also demonstrated that higher blood pressure control has a positive, rather than a negative, influence on quality of life.

There are increasing pressures on physicians to achieve better control of blood pressure. There have been a number of new guidelines in hypertension management in the past two years. For example, the Joint National Committee VI and British Hypertension Society guidelines detail revised thresholds for confirming a diagnosis of hypertension and provide more explicit treatment goals.^{4,8} In addition, the realisation that coronary heart disease is the biggest threat to global health will increase the pressure for effective anti-hypertensive treatment. There will also be greater pressure for physicians to recognise

that coronary heart disease is a multifactorial disorder and that hypertension is but one, albeit very significant, component. It is important that other factors are also considered including cholesterol level, age, family history, and smoking status (fig 2). Using formal cardiovascular risk scores which are all based upon the Framingham equation will lead to a more comprehensive management of patients.

THE FUTURE

Prescribing for hypertension is set to rise because currently there is both under diagnosis and under treatment. Many patients will require polypharmacy to achieve blood pressure targets and patient concordance will be important to make this strategy work. These requirements should result in the wider availability and usage of fixed dose treatment combinations. Management will also become more patient specific with the identification and aggressive tailoring of treatment to specific subgroups of patients at higher risk—for example, diabetics or those with heart failure.

Heart failure

The management of heart failure presents similar important issues. Heart failure is common and will become more common as the population continues to age and more people survive myocardial infarctions.

Importantly, heart failure has a cancer-like mortality rate that is related to disease severity. This is illustrated by data from the largest health region in the UK, looking at the survival rate for patients with different diagnoses. Diagnosis of heart failure was associated with a significantly worse prognosis over three years than prostate or breast cancer.⁹

Interestingly, most western health care systems now screen for breast cancer in order to facilitate early detection and treatment. Indeed, the USA also screen for prostate cancer although it is much less prevalent than heart failure and the outcome is much better. In fact, the prognosis for heart failure in this cohort of eight million people is almost identical to that for colorectal cancer. Clearly, heart failure is a very significant and under emphasised in terms of patient care.

CURRENT PRACTICE IN HEART FAILURE

Diagnosis

Data from most surveys suggest that only approximately one third of patients with a diagnosis of heart failure in the community have evidence of left ventricular dysfunction on objective testing.¹⁰⁻¹³

As part of the ECHOES trial, nearly 1000 patients with an existing clinical diagnosis of heart failure were randomly selected from a community population of 15 000 people.¹² Only 25% of this random sample had definite left ventricular dysfunction on echocardiography, and a further 12% were borderline with ejection fractions of 40–50%. Interestingly, 23% were in atrial fibrillation, in whom only half actually had left ventricular dysfunction. If

Table 1 The criteria used by primary care physicians to diagnose heart failure during the Euro-HF study

	Symptoms (%)	Symptoms and signs (%)	Only after tests (%)	Only after referral (%)
France	52	17	17	20
Germany	31	33	28	8
Italy	31	34	20	16
Netherlands	28	35	21	15
Spain	30	32	22	10
UK	17	55	19	9

Table 2 Selected adverse experiences

	Patients with adverse experience		Patients requiring withdrawal of study drug	
	High dose lisinopril (n=1588)	Low dose lisinopril (n=1596)	High dose lisinopril (n=1588)	Low dose lisinopril (n=1596)
Worsening heart failure	594 (38%)	709 (44%)	62 (4.0%)	76 (4.8%)
Dizziness	297 (19%)	193 (12%)	5 (0.3%)	0
Hypotension	169 (11%)	107 (7%)	13 (0.8%)	10 (0.6%)
Worsening renal function	155 (10%)	112 (7%)	5 (0.3%)	6 (0.4%)
Increased cough	166 (11%)	211 (13%)	14 (0.9%)	14 (0.9%)
Hyperkalaemia	100 (6%)	56 (4%)	6 (0.4%)	1 (0.1%)
Hypokalaemia	22 (1%)	53 (3%)	0	0

these patients are added to those patients with valve abnormalities, then 60% of the patients diagnosed with heart failure actually had some structural abnormality of their heart.

Treatment

ACE inhibitors are the most evidence based treatment currently available for heart failure; however, only a minority of patients who are eligible for ACE inhibitor treatment are prescribed them by their general practitioner.

A small survey carried out in Nottingham in the UK suggested that the reason for this under use was not because primary care practitioners were unaware of the benefits, but because they were more concerned about the perceived risks associated with ACE inhibitors.¹⁴ The same situation is also seen in hospital practice with under performance both in terms of initiating patients on ACE inhibitors and also using sufficiently high doses.

This under performance may be the result of diagnostic and therapeutic issues. The European Society of Cardiology definition of heart failure requires the presence of appropriate symptoms, objective evidence of cardiac dysfunction and, ideally, response to treatment. Effectively, this excludes the possibility of making a clinical diagnosis of heart failure because symptoms are non-specific. In addition, if only symptoms are used to make a diagnosis, patients will be detected relatively late in their illness.

Euro-HF

The Euro Heart Failure study provides useful data on how heart failure is actually diagnosed in clinical practice.¹⁵ It comprised a random sample of primary care practitioners across six European countries, looking at their perceptions of heart failure, diagnosis and management. The results showed that in all of the countries, the majority of general practitioners were diagnosing heart failure on clinical grounds, with only a minority using tests and an even smaller number diagnosing after referral (table 1). The tests they were using were almost exclusively ECG or chest x ray, with only a minority using echocardiography for confirmation.

In terms of prescribing, Euro-HF revealed that general practitioners themselves knew that they were under treating; prescribing low doses in over two thirds of patients. This is also true in the USA where data show that three quarters of the doses of enalapril selected to treat

Trial acronyms

ATLAS: Assessment of Treatment with Lisinopril And Survival
 ECHOES: Echocardiographic Heart of England Screening Study
 Euro-HF: European Heart Failure study
 HOT: Hypertension Optimal Treatment study
 UKPDS: United Kingdom Prospective Diabetes Study

congestive heart failure were below treatment doses in trials. The reason for this under prescribing was that, although the general practitioners knew that ACE inhibitors reduced mortality, they were concerned about risks associated with treatment. Their main concerns were renal impairment and hypotension. The recent ATLAS study, however, has shown that treatment with high doses of lisinopril is associated with a significant reduction in combined deaths and hospitalisations, without concomitant increase in the risk of serious adverse events (table 2).^{16 17}

Conclusion

There is much evidence to demonstrate the continued major gaps between evidence and routine clinical practice in the management of both heart failure and hypertension. Qualitative data would indicate that lack of knowledge of treatment benefits is not the major factor contributing to this under performance. A complex interplay between physician perceptions of the balance between risk and benefit appears to be a major contributing influence. There are, therefore, many issues relating to both physicians and patients that need addressing if patients are to truly benefit.

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